

## 3-5 Write and Graph Equations of Lines

Slope-intercept form  $y = mx + b$ Standard form  $Ax + By = C$ **A, B, & C are integers, A is positive,****A, B, & C have a GCF of 1**

Write the equation of the line given the following information.

1.  $(0, 8)$   $m = 3$ 

$$y = mx + b$$

$$y = 3x + 8$$

2.  $(-3, -6)$   $m = 2$ 

$$y = 2x + b$$

$$-6 = 2(-3) + b$$

$$0 = b$$

$$y = 2x$$

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3.  $(6, -3)$   $(8, -9)$ 

$$m = \frac{-9 - (-3)}{8 - 6} = \frac{-6}{2} = -3$$

$$y = -3x + b$$

$$-3 = -3(6) + b$$

$$15 = b$$

$$y = -3x + 15$$

4. Write the equation of the line  $\perp$  to  $2x + y = 5$  and passes through  $(1, -7)$ .

$$m = \frac{1}{2} \quad (1, -7)$$

$$y = \frac{1}{2}x - 7\frac{1}{2}$$

$$2y = x - 15$$

$$15 = x - 2y$$

Put in standard form.  $x - 2y = 15$ 

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5. Write the equation of the line  $\parallel$  to  $3y - x = 4$  and passes through  $(3, 10)$ .

$$y = \frac{1}{3}x + 9$$

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6. Write the equation of the line  $\perp$  to the line containing  $(4, 3)$   $(4, 8)$  and passing through  $(2, -9)$ .

$$y = -9$$

$m = \text{undefined}$

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7. Write the equation of the perpendicular bisector of  $\overline{PQ}$ .  
 $P(8,4)$   $Q(12, 6)$

$$M\left(\frac{8+12}{2}, \frac{4+6}{2}\right)$$

$$M(10, 5)$$

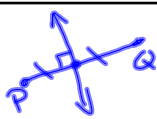
$$m = -2$$

$$5 = -2(10) + b$$

$$25 = b$$

$$y = -2x + 25$$

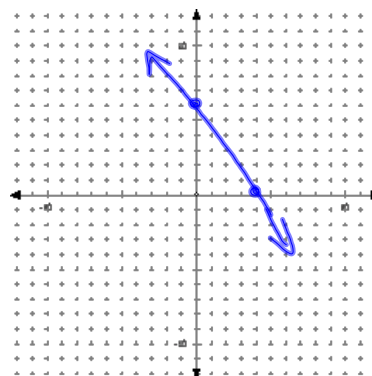
Find the slope of  $\overline{PQ}$

$$m = \frac{6-4}{12-8} = \frac{2}{4} = \frac{1}{2}$$


Graph  $3x + 2y = 12$  using intercepts.

$$(0, 6)$$

$$(4, 0)$$



Oct 25-9:55 AM

Nov 7-2:49 PM

HW p184 #s 16, 17, 22-24, 26, 31, 34, 38, 46

**WRITING EQUATIONS** Write an equation of the line that passes through the given point  $P$  and has the given slope  $m$ .

16.  $P(-1, 0)$ ,  $m = -1$

17.  $P(5, 4)$ ,  $m = 4$

22. **WRITING EQUATIONS** Write an equation of a line with undefined slope that passes through the point  $(3, -2)$ .

**PARALLEL LINES** Write an equation of the line that passes through point  $P$  and is parallel to the line with the given equation.

23.  $P(0, -1)$ ,  $y = -2x + 3$

24.  $P(-7, -4)$ ,  $y = 16$

26.  $P(-2, 6)$ ,  $x = -5$

**PERPENDICULAR LINES** Write an equation of the line that passes through point  $P$  and is perpendicular to the line with the given equation.

31.  $P(-1, 1)$ ,  $y = \frac{7}{3}x + 10$

34.  $P(0, -5)$ ,  $x = 20$

**GRAPHING EQUATIONS** Graph the equation.

38.  $4x - y = -8$

**PERPENDICULAR BISECTORS** Find the midpoint of  $\overline{PQ}$ . Then write an equation of the line that passes through the midpoint and is perpendicular to  $\overline{PQ}$ . This line is called the *perpendicular bisector* of  $\overline{PQ}$ .

46.  $P(-4, 3)$ ,  $Q(4, -1)$

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Nov 8-8:12 AM